ABSTRACT

An imager device that has mitigated dark current leakage and punch-through protection. The transistor associated with the photoconversion device is formed with a single (i.e, one-sided) active area extension region on one side of the transistor gate opposite the photoconversion device, while other transistors can have normal symmetrical (i.e, two-sided) active area extension regions (e.g., lightly doped drains) with resulting high performance and short gate lengths. The asymmetrical active area extension region of the transistor associated with the photodiode can serve to reduce dark current at the photoconversion device. The punch-through problem normally cured by a lightly doped drain is fixed at the transistor associated with the photoconversion device by adding a V_t adjustment implant and/or increasing its gate length.